

REMARKS

In response to the Office Action mailed August 19, 2008, Applicant respectfully requests reconsideration. Claims 1-15, 17-43, 46-56 and 58-61 were previously pending in this application. Claims 1, 48-50 and 58 have been amended. As a result, claims 1-15, 17-43, 46-56 and 58-61 are pending for examination with claims 1, 15, 30, and 43 being independent. No new matter has been added.

Allowable Subject Matter

Applicants note with appreciation the indication of allowable subject matter in claims 7-14, 19-27, 34-42, 48-56 and 58.

Objections to the Claims

The Office Action objected to claims 48-56 and 58 because these claims depended on claim 44 which was canceled. In response, Applicants have amended claims 48, 49, 50 and 58 to depend from claim 43 instead of claim 44. Accordingly, withdrawal of these objections is respectfully requested.

Rejections Under 35 U.S.C. §102

I. The Office Action rejected claims 1-6, 15, 17, 18, 28-33, 43, 46, 47 and 59-61 (including independent claims 1, 15, 30 and 43) under 35 U.S.C. §102(b) as purportedly being anticipated by Gaul et al., U.S. Patent No. 6,114,768. Applicants have amended claim 1 herein and respectfully request reconsideration of the rejection of claim 1 and its dependent claims. Applicants respectfully traverse the rejections of independent claims 15, 30, 43 and their dependent claims.

A. Discussion of Gaul

FIG. 11 of Gaul shows a semiconductor structure in which several PMOS transistors 210-211 and NMOS transistors 212-213 are formed in a substrate 220. Each transistor has p+ or n+ source/drain diffusions 201 and 202 diffused from one surface of the substrate to the other surface (Col. 7, lines 9-23). A polysilicon gate 203 is formed above the source/drain diffusions on a gate oxide layer 204 that covers the upper surface 221 of the substrate 220.

B. Independent Claim 1

Claim 1, as amended, recites a MOS-type power component in which each of the source, gate and drain regions constitutive of the component extend perpendicularly to a surface of a semiconductor chip substantially across an entire thickness of the semiconductor chip. Gaul does not teach or suggest a gate region that extends perpendicularly to a surface of a semiconductor chip substantially across an entire thickness of the semiconductor chip. The Office Action relies upon FIG. 11 of Gaul as purportedly showing the limitations of claim 1. However, FIG. 11 of Gaul shows that the gates 203 of Gaul's NMOS and PMOS transistors are formed on top of the substrate 220 above the source/drain diffusions 201 and 202. Gaul's gates 203 are formed on top of substrate 220 and do not extend substantially across an entire thickness of the semiconductor chip. For these reasons, claim 1 patentably distinguishes over Gaul. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 2-14 and 60-61 depend from claim 1 and patentably distinguish over Gaul for at least the same reasons.

C. Independent Claim 15

Claim 15 recites, *inter alia*, semiconductor regions extending through the substrate; and contacts extending through the substrate and contacting the semiconductor regions within the substrate. Gaul does not teach or suggest contacts extending through the substrate and contacting the semiconductor regions within the substrate. The Office Action relies upon FIG. 11 of Gaul as purportedly showing contacts as unlabeled regions of FIG. 11 that are formed adjacent to the source and drain regions. Applicants respectfully disagree. Neither FIG. 11 of Gaul nor the associated text (Col. 7, lines 9-23) discloses or suggests that contacts extend through substrate 220. At best, FIG. 11 of Gaul shows that unlabeled regions are present in substrate 220 to the left of region 201 and to the right of region 202. However, Gaul does not describe the composition or function of these unlabeled regions, and it is unclear whether the unlabeled regions are conductive or insulating, for example. Gaul does not suggest that these unlabeled regions are contacts, much less metal fingers, as recited in claim 15. For these reasons, claim 15 patentably distinguishes over Gaul. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 17-29 depend from claim 15 and patentably distinguish over Gaul for at least the same reasons.

D. Independent Claim 30

Claim 30 recites, *inter alia*, a MOS-type power component, wherein contacts with the semiconductor regions are made substantially across the entire thickness of the semiconductor chip by conductive fingers. Gaul does not teach or suggest that contacts with the semiconductor regions are made substantially across the entire thickness of the semiconductor chip by conductive fingers. The Office Action relies upon unlabeled regions in FIG. 11 of Gaul as purportedly being the contacts recited in claim 30. However, as discussed above, Gaul does not suggest that the unlabeled regions of FIG. 11 of Gaul are contacts. Gaul provides no information about these unlabeled regions, and it is unclear as to whether these regions are conductive or insulating. Claim 30 patentably distinguishes over Gaul because Gaul fails to teach or suggest these limitations of claim 30. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 31-42 depend from claim 30 and patentably distinguish over Gaul for at least the same reasons.

E. Independent Claim 43

Claim 43 recites, *inter alia*, a MOS-type power component, comprising contacts extending through the substrate, wherein the first region is contacted within the substrate by at least one of the contacts, and wherein the contacts are metal fingers. Gaul does not teach or suggest contacts extending through the substrate, wherein the first region is contacted within the substrate by at least one of the contacts, and wherein the contacts are metal fingers. The Office Action relies upon unlabeled regions in FIG. 11 of Gaul as purportedly being the contacts recited in claim 30. However, as discussed above, Gaul does not suggest that the unlabeled regions of FIG. 11 of Gaul are contacts. Gaul provides no information about these unlabeled regions, and it is unclear as to whether these regions are conductive or insulating. Gaul does not suggest that these unlabeled regions are contacts, much less metal fingers, as recited in claim 43. For these reasons, claim 43 patentably distinguishes over Gaul. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 46-59 depend from claim 43 and patentably distinguish over Gaul for at least the

Claims 46-59 depend from claim 43 and patentably distinguish over Gaul for at least the same reasons.

II. The Office Action rejected claims 1, 4 and 5 (including independent claim 1) under 35 U.S.C. §102(e) as purportedly being anticipated by Mathew et al., U.S. Published Patent Application No. 2003/0151077. Applicants respectfully request reconsideration.

Matthew describes a technique for forming a vertical double gate semiconductor device. FIGS. 8, 9 and 15 of Matthew show that the semiconductor device includes two separate gate regions 62, 64 that are formed above substrate 12 and insulator 14. Matthew states that the semiconductor device includes source/drain regions 52 and 54 that are also formed above substrate 12 and insulator 14 (¶24, FIGS. 8, 9 and 15).

By contrast, claim 1, as amended, recites a MOS-type power component in which each of the source, gate and drain regions constitutive of the component extend perpendicularly to a surface of a semiconductor chip substantially across an entire thickness of the semiconductor chip. Matthew does not teach or suggest that any of the source, gate or drain regions constitutive of the component extend substantially across an entire thickness of the semiconductor chip. Rather, FIGS. 8, 9 and 15 of Matthew show that the source and drain regions 52, 54 and gate regions are formed above the substrate 12, and these regions are separated from substrate 12 by insulator 14. The source and drain regions 52, 54 and gate regions 62, 24 are formed above the substrate 12 and do not extend substantially across an entire thickness of the semiconductor chip. For these reasons, claim 1 patentably distinguishes over Matthew. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 2-14 and 60-61 depend from claim 1 and patentably distinguish over Matthew for at least the same reasons.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, the Director is hereby authorized to charge any deficiency or credit any overpayment in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 23/2825, under Docket No. S1022.81119US00.

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Respectfully submitted,

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